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<input type="checkbox"/>	L16	(first adj DC) same (second adj DC)	2463
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<input type="checkbox"/>	L1	(wireless same (pda or (personal adj digital adj assistant)))	7392

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L29: Entry 4 of 4

File: USPT

Apr 20, 1999

DOCUMENT-IDENTIFIER: US 5896574 A

TITLE: Wireless modem with a supplemental power source

Detailed Description Text (3):

An embodiment of the present invention is shown in FIG. 2. A host device 201, such as an IBM Thinkpad computer, having stacked PCMCIA slots (203A, 203B), is shown. For the purposes of this specification, "Mobile Computer" is a generic term used to describe a machine, which is usually a computer or terminal or lap top or palm top or hand held or personal digital assistant or other computer. In the preferred embodiment the mobile computer provides slots for accepting adapter cards that meet applicable Personal Computer Memory Card International Association (PCMCIA) standards. As shown the wireless modem consists of a first PCMCIA adapter card 205 containing the baseband portion of the modem and a second PCMCIA adapter card 207 for providing additional power to the radio module 209. A Y cable 211 is shown for connecting each of the PCMCIA cards to the radio module 209. The radio module 209 is shown with antenna 213. Note that the radio module can be mounted on the host device 201 such as the back of the display or integrated into the host device 201. The radio module 209 is supplied power from both PCMCIA cards via the Y cable. In an alternative embodiment the baseband adapter card and radio module can be integrated into a single card that can be inserted into a PCMCIA slot. A connector can be added to the single integrated card so that the passive power card can provide power to the integrated card. The single integrated card may have a section that protrudes externally from the PCMCIA slot when the integrated card is inserted into the slot.

Current US Original Classification (1):455/557[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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L11: Entry 2 of 4

File: USPT

Jun 24, 2003

DOCUMENT-IDENTIFIER: US 6581837 B1

TITLE: Wireless interface for bar code scanner

Abstract Text (1):

A powered wireless link device powers a bar code scanner or other optical symbol reader and connects it with a remote computer terminal. The link device has a housing that contains a battery, a data-powered RF (or IR) interface unit, a serial data connector on the housing for connecting to a connector on the cord of the scanner, and a wiring assembly to connect data pins of the connector with corresponding pins of the interface unit, and leads that impose a dc voltage on selected pin or pins of the connector and the interface unit. The wiring arrangement may include a voltage regulator IC. The battery may be removable for replacement or recharging. The wireless link device can be belt worn, where the belt has holsters for the device and for the scanner. The link can be effective up to 500 feet or more, facilitating inventory control or similar functions. A link of over a mile is possible. An optional signal splitter or wye adapter permits two devices, such as a scanner and a printer, to be connected at the same time to the RF interface device.

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L5: Entry 1 of 4

File: USPT

Jun 9, 1992

DOCUMENT-IDENTIFIER: US 5120258 A

TITLE: Low inductance shielded cable to printed circuit board connection apparatus.

Detailed Description Text (7):

The prime objective of this invention is to provide an inexpensive dielectric for accomplishing a capacitive connection between the shielded circuit connector such as 10 and chassis ground while still passing the RF signal to other circuitry without contamination from outside sources. The prior art approach has been to bring a shielded conductor into an appropriate (but very expensive) interface connector attached to the outside of a shielded container and then have another shielded circuit cable go from that connector to the printed circuit board mounted internal the shielded structure. Thus, there were often three shielded cable circuit connectors involved with one on each side of the shielded container and usually a further one attached to a device similar to item 10 mounted on the printed circuit board. The present inventive concept reduces the number of connectors by at least a factor of 2, eliminates the very expensive chassis ground connector interface of the prior art and, since the circuitry may all be contained on or within a multiple layer printed circuit board, can effectively shield the signal from deleterious electromagnetic effects.

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L5: Entry 2 of 4

File: USPT

Feb 11, 1992

DOCUMENT-IDENTIFIER: US 5087888 A

TITLE: Light weight power amplifier assembled with no hand soldering or screws

Detailed Description Text (3):

FIG. 2 depicts an exploded view of a RFPA chassis (20) with the function modules (13) removed. As shown an interconnect board (21) is mounted in a slot (not shown) along the bottom of the RFPA chassis. A number of interface connectors (22, 23, and 24) may be mounted to the interconnect board for connections between the interconnect board (21) and the function modules (not shown in FIG. 2) and between individual function modules (not shown in FIG. 2). Also mounted on the chassis (20) are the coaxial connectors (not shown) used to introduce the modulated RF signal into the RFPA and the coaxial connector used to route the output of the RFPA to an external load.

Detailed Description Text (4):

Mounted within the RFPA chassis (20 in FIG. 2) are the function modules (13) used to amplify the RF signal. Shown (FIG. 3A and FIG. 3B) is a compensation function module (30) (general use function module). The function module (30) is interconnected with the RFPA chassis by an interface connector (31) located at the bottom of the function module (30). The function module (30) is constructed with sufficient space on the heat pipe (32) between the bottom of the fins (33) and the top of a function module cooling block (34) to allow the function module (30) to be inserted into the RFPA chassis (20) without engagement of the interconnect connectors (22, 23, and 24). Following insertion of the function module (30) into the RFPA chassis (20) the function module (30) is then seated, by direct pressure, into the interconnect connectors (22, 23, and 24).

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L5: Entry 3 of 4

File: USPT

Sep 13, 1988

DOCUMENT-IDENTIFIER: US 4771294 A

**** See image for Certificate of Correction ****

TITLE: Modular interface for monolithic millimeter wave antenna array

Detailed Description Text (19):

As will be appreciated from the foregoing description, the present invention provides a packaging mechanism for housing a plurality of high frequency monolithic integrated circuit chips that not only ruggedizes the signal interface connectors but provides substantial heat dissipation and avoids complex hardware constraints of conventional packaging arrangements where all signal interface ports are derived from the same side of the packaging structure. Through the use of the distribution of depressions and thermal pillars in the coldplate/waveguide element, the printed wiring board structure, through which chip control signals are supplied, may be disposed in substantially the immediately adjacent vicinity of the RF modules, rather than being placed in the vicinity of the waveguide structure which creates the practical problem of a dual interface across the thickness of the mounting hardware. Input/output signals can be extracted at the side of the printed wiring boards away from the ports whereat RF signals are interconnected with the waveguide structure of rectangular waveguide element. This also permits a simplified interconnection scheme comprised of coaxial transmission line connector pins in direct alignment with the RF connectors of each RF module and the waveguide structure therebeneath.

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L3: Entry 4 of 6

File: USPT

Dec 30, 2003

DOCUMENT-IDENTIFIER: US 6670926 B2

TITLE: Wireless communication device and information-processing apparatus which can hold the device

Brief Summary Text (7):

In recent years, wireless communication devices have come to be mounted in mobile information-processing apparatuses such as notebook-type personal computer and PDAs. To mount a wireless communication device in an information-processing apparatus, two methods may be used. A first method is to incorporate the wireless communication device into the housing of the information-processing apparatus. The second method is to insert the device in the form of a PC card into a PC card slot provided in the housing of the information-processing apparatus. The second method is preferable in view of the manufacturing cost of the mobile information-processing apparatus. This is because the PC card (i.e., wireless communication device) is an optional unit, which the user buys and inserts into the PC card slot after he or she has bought the mobile information-processing apparatus.

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L3: Entry 1 of 6

File: USPT

Aug 3, 2004

DOCUMENT-IDENTIFIER: US 6769607 B1

TITLE: Point of sale and display adapter for electronic transaction device

Abstract Text (1):

An adapter for use with a conventional POS card reader to interface with PDA's, Wireless Phones, and other Handheld devices, through Infrared or RF media, such that signals received from the devices can be converted to conventional magnetic stripe and/or smart card format, as required by the conventional POS card readers. The adapter includes a housing, including at least a reader-insertable portion capable of being inserted in the card reader, a receive circuit in the housing, a processor in the housing connected to the receive circuit; and a point of sale interface in the reader insertable portion of the housing and connected to the processor. The housing may be approximately the size of a conventional credit card and may be fully reader-insertable.

Brief Summary Text (17):

What is provided is an adapter for use with a conventional POS card reader to interface with PDA's, Wireless Phones, and other Handheld devices, through Infrared or RF media, such that signals received from the devices can be converted to conventional magnetic stripe and/or smart card format, as required by the conventional POS card readers. The adapter includes a housing, including at least a reader-insertable portion capable of being inserted in the card reader, a receive circuit in the housing, a processor in the housing connected to the receive circuit; and a point of sale interface in the reader insertable portion of the housing and connected to the processor. The housing may be approximately the size of a conventional credit card and may be fully reader-insertable.

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L3: Entry 2 of 6

File: USPT

Jul 13, 2004

DOCUMENT-IDENTIFIER: US 6762725 B2

TITLE: PC card retractable antenna

Brief Summary Text (3):

Portable communication devices, such as lap-top computers, palm-top computers, and PDA (personal digital assistants) are becoming common in offices. For these devices to communicate with a computer network, commonly referred to as a Local Area Network (LAN), the communication device must be able to attach to the network, typically through a LAN interface adapter attached to a LAN cable. Such LAN cable connections generally restrict the mobility of communication devices. Recently, networks have been developed that allow wireless communication. For the communication device to communicate with the wireless network, the communication device must have an antenna. Typically, the antenna is attached to a wireless network card inserted into the communications device. For example, in smaller devices such as laptops the card is inserted into a PC card slot, e.g., a PCMCIA (Personal Computer Memory Card Interface Association). To avoid signal interference with the mechanics of the communications device card slot, the antenna for the wireless communications device must be located outside of the device's card slot or housing to function properly.

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L19: Entry 1 of 3

File: USPT

Nov 4, 1997

DOCUMENT-IDENTIFIER: US 5684682 A

TITLE: Method and apparatus for selectable DC to DC conversion

Detailed Description Text (3):

Receiving and decoding paging signals is well known in the art. The paging signals may be received on any of a plurality of paging protocols such as the GSC, POGSAG, or other protocols. In response to the reception of the paging signals, the receiver 112 is periodically activated. Additionally, the decoder operates in a low power mode while the receiver 112 is inactive and operates in a high power mode while the receiver 112 is active. The decoder searches the paging signal for an address which matches an address stored in memory 118. In response to detecting the address, an alert 120 may be generated, such as a tone or vibration which causes an increased load on the circuitry. Furthermore, the LCD display may include a light 122 which also loads the circuitry. Thus, it can be appreciated that the power consumption may vary dramatically.

Detailed Description Text (5):

Referring generally to FIG. 1, the preferred embodiment of the invention generally includes, a voltage detector 152 for detecting a voltage level in a circuit; first DC to DC converter configuration of the DC to DC converter 130 (e.g., voltage doubler) for converting a first DC voltage, (e.g., the battery voltage, VBB) to a first converted DC voltage, (e.g., Vout); second DC to DC converter configuration of the DC to DC converter 130 (e.g., voltage tripler) for converting the first DC voltage, VBB, to a second converted DC voltage, (e.g., Vout); selector circuitry 134 responsive to the voltage detector 152 for selectively enabling the first or the second converters; and a voltage regulator 132 for regulating the first and second converted DC voltage (e.g., Vout) to a predetermined regulated voltage, VDD. The selector circuitry 134 initially enables the first converter configuration, and then disables the first converter configuration and enables the second converter configuration when the voltage level drops below a reference voltage, VREF, substantially equal to a minimum required voltage to adequately drive a load.

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L19: Entry 3 of 3

File: USPT

Jun 30, 1992

DOCUMENT-IDENTIFIER: US 5126686 A

TITLE: RF amplifier system having multiple selectable power output levels

Brief Summary Text (9):

More specifically, the present invention includes a variable gain amplifier which is responsive to a power level control signal. A directional coupler is coupled between the output of the variable gain amplifier and the output of the amplifier system. The RF signal is coupled through the primary coupling of the coupler. The output of secondary coupling of the directional coupler is coupled to a plurality of attenuators whose outputs comprise first and second RF feedback signals. A diode detector means generates a DC output signal of a selected one of said feedback signals by means of a switching means which is responsive to a first control signal. The DC output signal of the diode detector means is coupled to the inverting input of an error amplifier. The output of the error amplifier is coupled to the power level control input of the variable gain amplifier. The non-inverting input of the error amplifier is coupled to a reference voltage generated by a digital-to-analog (DAC) converter. Preferably the DAC is a four step converter for selectively generating one of four discrete output voltage levels. The four step digital-to-analog converter is controlled by second and third control signals. The present invention provides relatively low or high power modes by selecting one of two RF signal attenuators with the first control signal. Within each of these modes, four discrete power levels are selected by altering the output voltage of the DAC with the second and third control signals. Therefore, eight discrete power levels are provided. Since the RF signal rectified by the diode detector means is limited to a dynamic range wherein the diode detector means V-I characteristic is substantially linear, the need for temperature compensation is eliminated.

Detailed Description Text (4):

The magnitude of the feedback signal is controlled by attenuating means 117, comprising in this embodiment resistors 118 and 120, selected by RF signal switching means 122 which is controlled by control lead 124. The attenuating means 117 provide linear or stepwise attenuation of the RF feedback signal. Thus, the feedback signal 114 is linearly attenuated to two discrete levels, a relatively high power mode and a relatively low power mode, by the two resistors 118 and 120, respectively.

Detailed Description Text (5):

Control lead 124 is coupled to terminal 126 and is adapted to switch the switching means 122 with a logic level signal A coupled to terminal 126. This logic level control signal corresponds to a first Automatic Output Control (AOC) signal. A number of techniques may be used to fabricate switching means 122. For example, switch means 122 may suitably comprise a relay, an FET or bipolar switching transistor or a PIN diode. A suitable PIN diode is the HP 6419-52. A suitable relay is the OMRON G5Y-154P. Therefore, the output power of the circuit 100 may be switched between relatively high and relatively low power modes based on the logic level signal appearing at terminal 126.

Detailed Description Text (8):

The output of digital-to-analog converter 128 is suitably controlled by second and third logic level AOC signals B and C appearing at terminals 130 and 132 respectively. The logic level signals appearing at terminals 126, 130 and 132, may be suitably identical to the automatic output control (AOC) signals referred to in the prior art references mentioned above. Depending on the particular state of the AOC signals appearing at terminals 130 and 132, the output of the four step digital to analog converter 128 may be switched between four discrete voltage levels which may be adjusted by resistors 134, 136, 138 and 140, respectively. Therefore, digital-to-analog converter 128 may be selectively caused to output any one of four output voltage reference levels thus providing four discrete power levels in the output of error amplifier I/O in both the relatively low and relatively high power modes. In total, eight discrete power levels are thus provided by amplifier 110, by selectively controlling the AOC logic level signals at terminals 126, 130 and 132. Bias for resistors 134, 136, 138 and 140 is provided by a DC voltage appearing at terminal 142.

Detailed Description Text (13):

This advantage of the present invention may be further understood by referring to FIGS. 2C through 2F. FIG. 2C is the representation the output signal generated by the switching means 122 wherein line A represents the RF output signal of switching means 122 which is input to diode 116 in the low power mode and line B represents the RF output of switching means 122 that is input to diode 116 in the high power output mode. FIG. 2D shows the output of the diode detector means 116 in each of the above-mentioned modes wherein the shaded areas on lines A and B represent the output of the diode detector means 116 in the temperature variant region. In the preferred practice of the present invention, the diode detector means 116 is not operated in a temperature variant region and the need for temperature compensation is thereby obviated.

Detailed Description Text (16):

In a preferred embodiment, these secondary couplings 303 and 305 provide means for attenuating the RF signal generated thereon by the primary coupling 306. It will be appreciated that the dual secondary couplings provide the same linear attenuation of the RF signal as is provided by the resistive attenuators 118 and 120 in FIG. 1. That is, dual secondary couplings 303 and 305 provide signal output leads of approximately -24dB and -10dB, respectively. These two levels correspond to the high and low power output modes.

CLAIMS:

9. An apparatus according to claim 8 wherein said switch means comprises a DC switch having a first input lead connected to the output of said first detector means and having a second input lead connected to the output of said second detector means, and having an output lead and a control lead, said switch means for selectively outputting on said output lead said first DC signal from said first detector means or said second DC signal from said second detector means in response to a control signal received on said control lead.

13. An RF amplification system for generating a plurality of discrete power amplification levels for an RF signal comprising:

a variable gain power amplifier means for generating an amplified RF signal at an output thereof and having gain control input lead and an input lead for receiving said RF signal;

means connected to said output of said variable gain amplifier means for generating first and second RF signals representative of said amplified RF signal, including first and second isolated coupling means for attenuation of said generated RF signals, such that each said attenuated signal is substantially in a temperature invariant range of operation of said detector means;

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L35: Entry 1 of 1

File: USPT

Mar 16, 2004

DOCUMENT-IDENTIFIER: US 6707867 B2

TITLE: Wireless local area network apparatus

Brief Summary Text (9):

The wireless local area network apparatus of the present invention is particularly advantageous for power management applications in which low power portable wireless stations are employed in the BSA. The stations periodically switch between a low power consumption state, in which their transceivers are de-energized, and a high power consumption state, in which their transceivers are energized, and can thereby receive periodic signals transmitted from some other station. The synchronization between the signals transmitted from some other station and the switching of the power-consumption state of the receiver stations is advantageously achieved by the apparatus of the present invention. The improved synchronization of the present invention allows for operation of the stations in a wireless local area network with reduced power-consumption, which is particularly important for stations having an on-board power supply.

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L37: Entry 1 of 8

File: USPT

Jun 8, 2004

DOCUMENT-IDENTIFIER: US 6745937 B2

TITLE: Low-power hand-held transaction device

Detailed Description Text (14):

As another example, device 118 may represent a barcode reader. Conventional barcode readers draw relatively large amounts of electrical power in order to operate an internal microprocessor, a light source (not shown), and an image sensor that collectively illuminate a target barcode and read the barcode via reflected light. Continuous operation of the barcode reader, even when the barcode reader is only activated by a push button trigger, may quickly deplete the electrical energy available to the LHTD. By careful design of communication protocols, the low power barcode reader 118 included in the LHTD 100 may be activated in a low-power state until it is needed, and is only then fully activated to a high-power state in order to read the barcode and transmit the barcode through the digital signal line 120 to the microprocessor 102. The LHTD may optionally use a low power laser, CCD, LED, optical, electrical, or magnetic readers.

Detailed Description Text (17):

FIG. 2 is a schematic diagram of a dual-power mode amplifier. The signal to be amplified is input on signal line 202 to the dual-power mode amplifier 200. A reference signal line is input to the dual-power mode amplifier 200 on input line 204. The amplified signal is output on output signal line 206. When the voltage differential between the input signal on line 202 and the reference signal on line 204 is less than a threshold value, the dual-power mode amplifier remains in a low-power state, drawing little or no current from the power supply (not shown) and producing no output signal. When, however, the voltage differential between the input signal on line 202 and the reference signal on line 204 exceeds the threshold value, the dual-power mode amplifier 200 transitions to a high-power state in which the dual-power mode amplifier 200 draws current from the power supply and produces an amplified signal on output line 206. Resistors 208 and 210 together set the gain for the amplifier, where the gain is the ratio of the resistance of resistor 208 divided by the resistance of resistor 210. The dual-power mode amplifier 200 has a fixed threshold voltage for the low power to high-power transition. The gain is set to provide a desired output voltage from relatively low-voltage input signals while allowing a reasonable level of discrimination based on the threshold voltage differential for the dual-power mode amplifier 200. By using dual-power mode amplifiers for amplifying signals input to the data input components of the LHTD, the data input components draw significant current only when input is being transmitted to them.

Detailed Description Text (56):

Although the present invention has been described in terms of one embodiment, it is not intended to be limited to this embodiment. Modifications within the sphere of the invention would be apparent to those skilled in the art. For example, a large number of different power-management strategies can be employed to insure that the hand-held device can operate efficiently and for relatively long periods of time using the electrical power available from the telecommunications link. As discussed above, capacitors and batteries can be used to store electrical power obtained from the telecommunications link for later use. As another example, many different types of input and output devices may be employed. The LHTD may include various types of

barcode readers, including single point band readers, CMOS image sensor readers, CCD readers, and low-power laser readers, and may also include various types of magnetic credit card readers, various types of electronic smart card readers, any number of different types of visual displays, keypads, sound generators, and sound input devices. The LHTD may include any number of different combinations of these input and output devices. A wide variety of different types and models of processors, voltage regulators, transceivers, amplifiers, microprocessors, and input and output devices can be used to build the LHTD. For example, the transceiver component may be implemented using any number of different modem chips, including V22, V29, V31, V32, and V34 chips. The V34 and V32 chips are Internet compatible, while the V29 and V31 chips are not Internet compatible, but provide very fast connect times. A wireless LHTD device may use both an RF transceiver to establish connection to the PSTN and a modem to communicate with a dial-up modem service or Internet Access Provider. Alternatively, the RF transceiver may be used in a wireless LHTD to communicate data-and-voice packets with the cell and have the cell provide the necessary data conversions and connections for Internet access. The LHTD may be used in literally thousands of different applications, having a breath of applicability larger, in many respects, than personal computers or laptop computers. For example, the LHTD contains hardware support for secure transactions using credit card numbers whereas personal computers generally do not support fully secure transactions because they lack fully protected memory. In fact, the LHTD may be employed as an add on to a personal computer for acquiring magnetic credit card numbers and electronic smart card numbers in encrypted forms for use in commercial transactions, avoiding input of this type of sensitive information in unencrypted form into the memory of the personal computer.

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L37: Entry 3 of 8

File: USPT

Sep 24, 2002

DOCUMENT-IDENTIFIER: US 6455953 B1

TITLE: Dual power modes electronics apparatus

Abstract Text (1):

A dual power sources apparatus operates in a normal low power mode and a momentary high power mode. One of the power source is of limited current capability and unlimited energy capacity. The other power source has much higher current capability but of limited energy capacity.

Detailed Description Text (8):

Attention is now drawn to FIG. 4 which illustrates the block diagram of another embodiment, a generic electronics apparatus connecting to the telephone socket. A typical application example of this embodiment is an in house paging transmitter. The in house paging system is useful to locate an employee inside large corporate buildings, without paying for the servicing fee of a public paging system. Block 401 represents a paging management system. When a paging request is received by the system 405, a wake up signal is sent to the paging transmitter 405 through the in house telephone line represented by the wires 402 and 403. The paging request is dialed into the management system 401 by intercom phone line. When a request is received, the management system 401 dials up all different RF transmitters located at different areas inside the buildings. The transmitter units, each represented by the block 405, are installed at convenient locations within the corporation premises. The paging signal sent by the management system wakes up the application circuit 406 which turns on the RF transmitter to transmit the paging codes. During standby, the application circuit was designed to enter an idle mode that consumes a very small current. The power supply of the application circuit 406 is obtained from the signal line 402 through the path 404. When a wake up signal is received, internal circuit of the management system 406 immediately switch the power supply line from 404 to the secondary power supply 411. In order for the power supply of the application circuit not to be interrupted, a power reservoir comprising a conventional diode plus capacitor or switch plus capacitor circuit is recommended to hold the initial power supply voltage when the voltage level of the low current power line 404 drops. In many situations the current supplied by the telephone line may not be sufficient to power active operation of the application circuit 406 especially during a RF transmission. The current flowing through the communication line 402 may be just enough to main the idle mode. On the other hand, the battery 411 is capable of providing much higher current than the communication line 402 to service the code reception and transmission modes of the application circuit 406. When the application circuit is transformed from a low current mode to a high current operation mode, the power supply of the application circuit is switched from the telephone line supported power path 404 to the battery supported power path 410. Since the duration of higher current mode is short and occasional, and the battery 411 is not connected most of the time, energy of the battery 411 is reserved. Similar to the embodiment of FIG. 2 and FIG. 3, if rechargeable batteries are used, the battery 411 can also be tickle charged by the voltage of the communication line 402 during the idle mode. In this way the transmitter unit 405 is completely maintenance free and does not require an external power adapter. The embodiment of FIG. 4 is identical in nature to that of FIG. 2 and FIG. 3 except the low current load and the high current load are not clearly identified. It is therefore desirable to broadly defining the lower power load as a low power

operation mode of the application circuit and the high power load as a higher power operation mode of the application circuit.

CLAIMS:

40. A paging transmitter having a majority low power operation mode and a high power operation mode comprising: a first power source powering most of the low power operation mode of said transmitter; and a second power source which is connected to the operation circuit during said high power operation mode.

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File: USPT

Sep 22, 1992

DOCUMENT-IDENTIFIER: US 5150361 A

TITLE: Energy saving protocol for a TDM radio

Brief Summary Text (2):

This invention relates generally to radio frequency communication systems, and more specifically to battery powered radios capable of operating in such systems, and is particularly directed toward a protocol for managing energy consumption in battery powered radios thereby prolonging operation within a time division multiplex (TDM) (or combined TDM/FDM) radio frequency communication system.

Detailed Description Text (9):

The controller 320 is the heart of the communication device and operates to control the many circuits comprising the communication device. In a portable embodiment of the communication device, a battery energy source 350 is coupled to a battery saver block 351 which under the control of the controller 320 provides power to each block of the communication unit. In order to conserve energy, the controller 320 periodically deactivates non-essential circuits by applying a control signal 353 to the battery saver circuit 351. In the preferred embodiment of the present invention, the battery saver circuit 351 deactivates the vocoder 308, the receiver 301 and A/D 306 via the control line 332; and a programmable (336) synthesizer 334 via control line 338. Of course, all of these circuits need not be activated for every embodiment, however, the preferred embodiment deactivates these circuits as they represent the most significant consumers of energy. Following circuit deactivation, the controller 320 triggers (346) a timer 340 and suspends (or greatly reduces the speed of) its own operation, which drastically reduces the current drawn by the controller. To recover from the energy saving state, a timer driven from a high stability (better than 10 ppm) reference oscillator 342 re-activates (344) the controller 320. After re-activation, the controller revives the temporarily deactivated circuits and operates to receive and decode at least a portion of the next control slot. The periodic deactivation/re-activation is precisely timed to insure that the communication unit re-activates immediately before a control slot so that signalling and control information may be received and acted upon. Deactivation may be retriggered after all or a portion of the control slots have been received. According to the invention, the communication unit may be made to function in one of two operational mode: a low power or energy saving mode and a high power or non energy saving mode. In the battery saving mode the communication device may be deactivated for a minimum of three quarters of a four slot TDM frame (less any wake-up time), awakening only to receive one of the two control slots used in the preferred embodiment of the present invention thereby keeping pace with system parameter changes, call assignments or other signalling or control messages.

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